

NTK

50°6'14.083"N, 14°23'26.365"E
Národní technická knihovna
National Library of Technology

Artificial Intelligence?!

Ibrahim Abou Khashabh

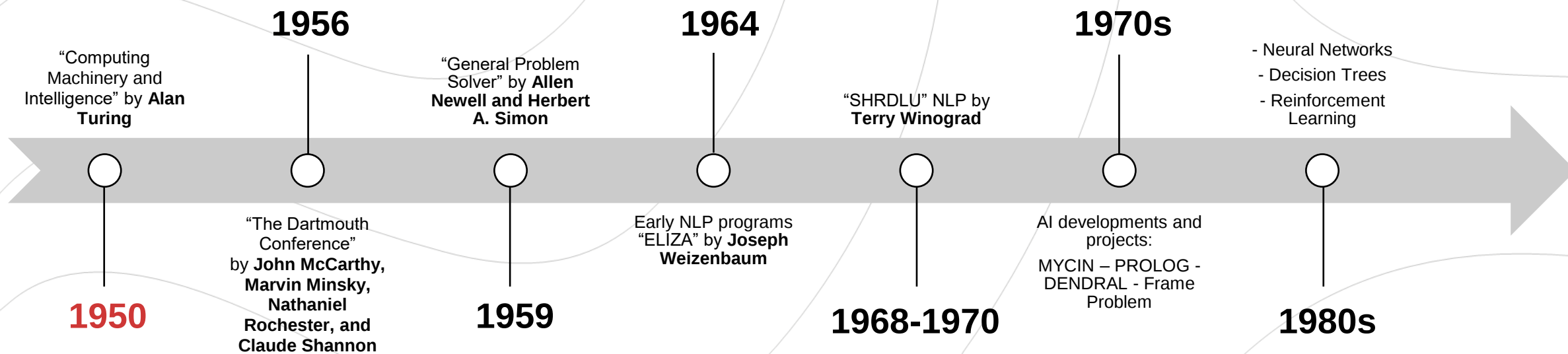
ibrahim.abou.khashabh@techlib.cz



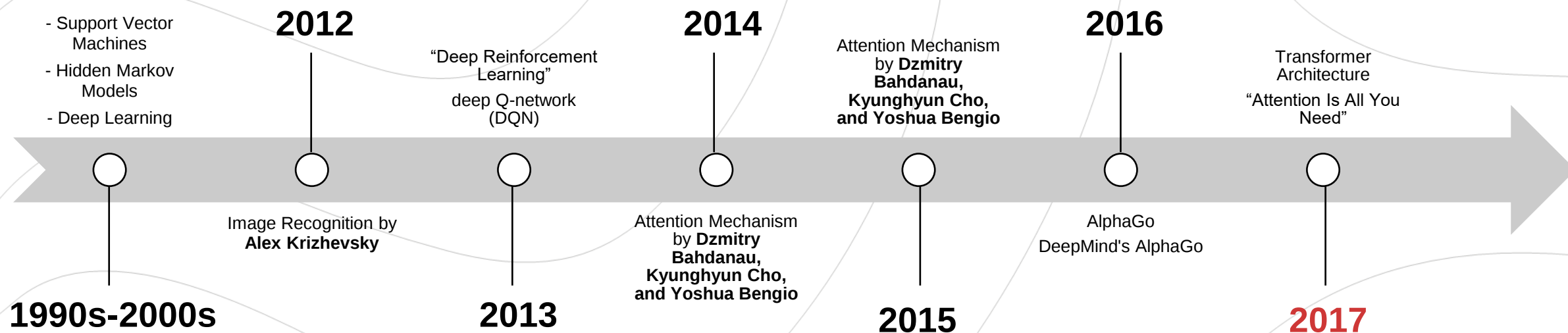
Agenda

- 1. Milestones in AI Development**
- 2. What is (AI)?**
 - a. Narrow (AI)
 - b. Strong (AI)
- 3. Machine Learning**
- 4. Deep Learning**
- 5. (AI) Applications:**
 - a. Image and video Recognition
 - b. Speech Recognition
 - c. Natural Language Processing (NLP)
 - d. Recommendation Systems
 - e. Gaming
- 6. Future of (AI)**
- 7. Impact of (AI) on Society**
- 8. Steps to Ensure Ethical AI**

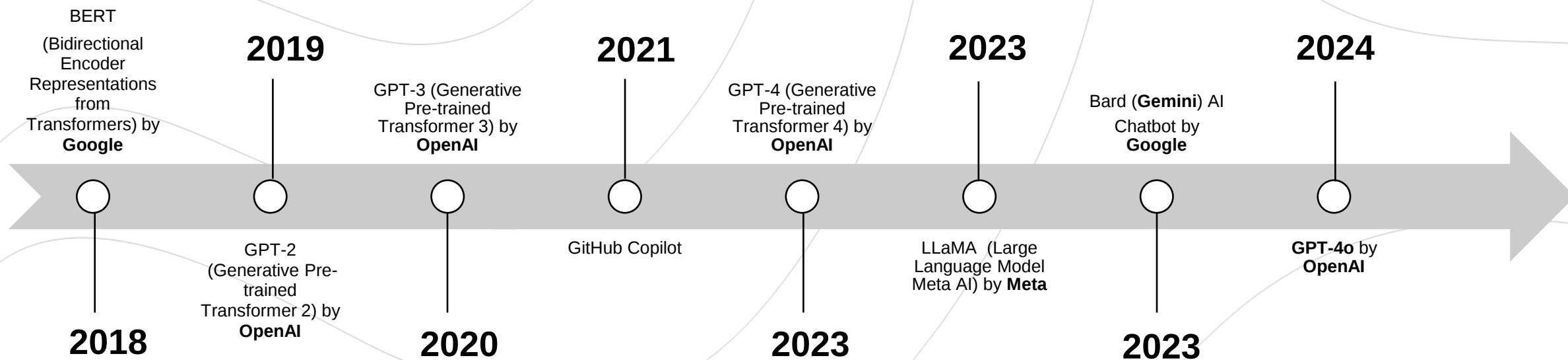
Milestones in AI Development



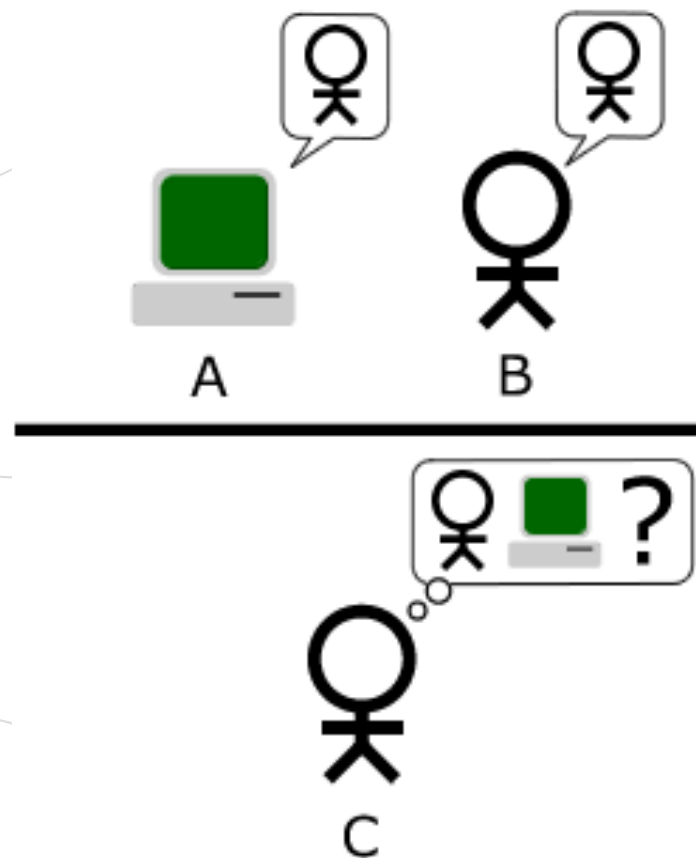
Milestones in AI Development



Milestones in AI Development



Turing's test



Source: Alan Turing, "Computing Machinery and Intelligence," Mind, 1950.

What is (AI)?

Human Intelligence

- The ability to learn, understand, and apply knowledge and skills.
- The ability to reason, plan, and solve problems.
- The capacity to understand complex ideas and think critically.
- The capacity for self-awareness and self-attention!

Artificial Intelligence

- The ability of machines to learn from experience.
- The use of computer algorithms and techniques to automate tasks and processes.
- The capability of machines to perform tasks that would typically require human intelligence.
- The capacity of a machine or computer program to learn, reason, and adapt.

What is (AI)?

Strong (AI)

Refers to an AI system that has the ability to perform any intellectual task that a human can.

Artificial General Intelligence (AGI)

Weak (AI)

Refers to AI systems designed to perform specific tasks within a limited domain.

Narrow (AI)

What is Machine Learning (ML)?

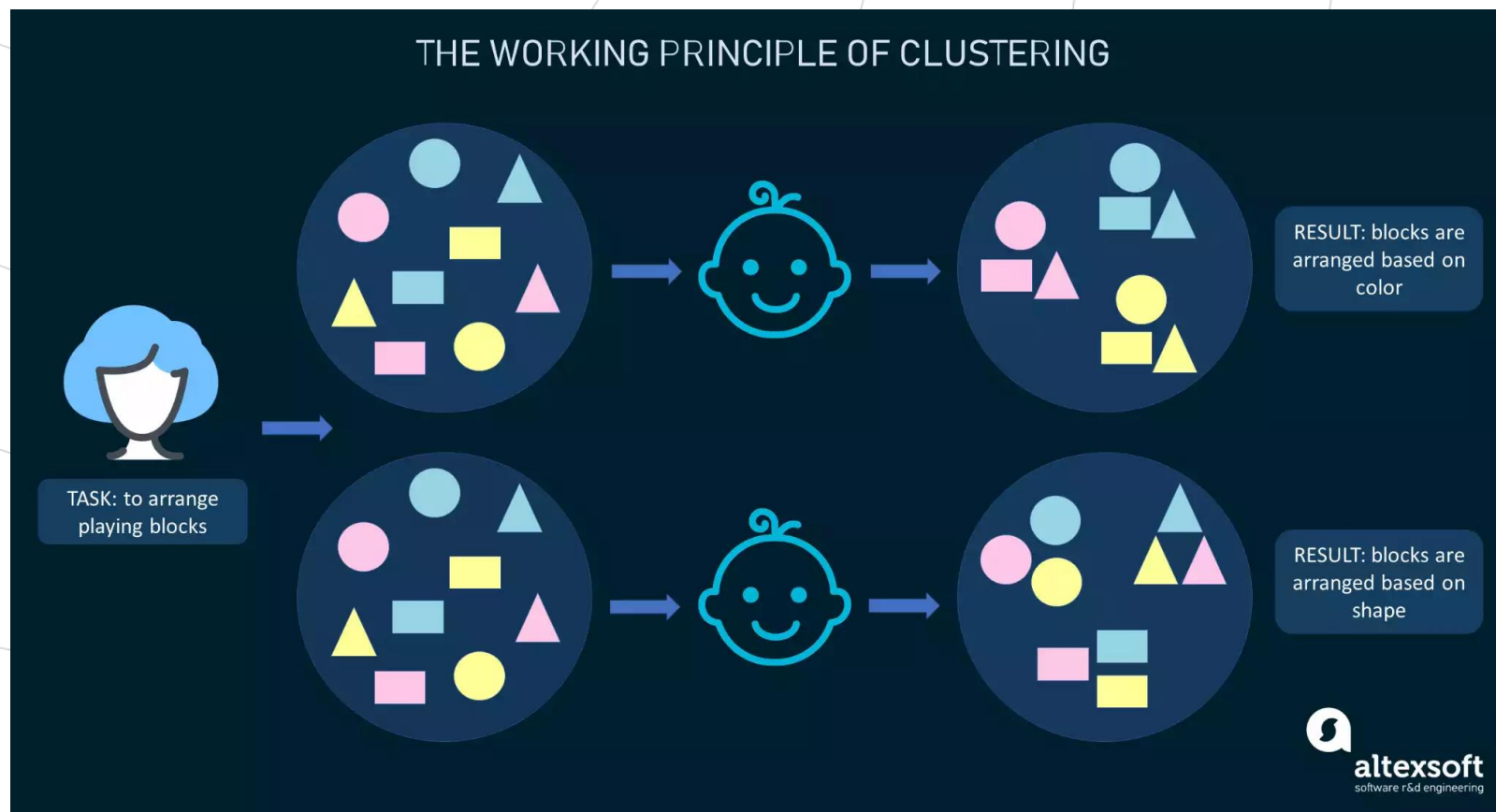
Subfield of artificial intelligence (AI) that involves developing algorithms and statistical models that enable computers to learn from data.



A digital image of a human head.

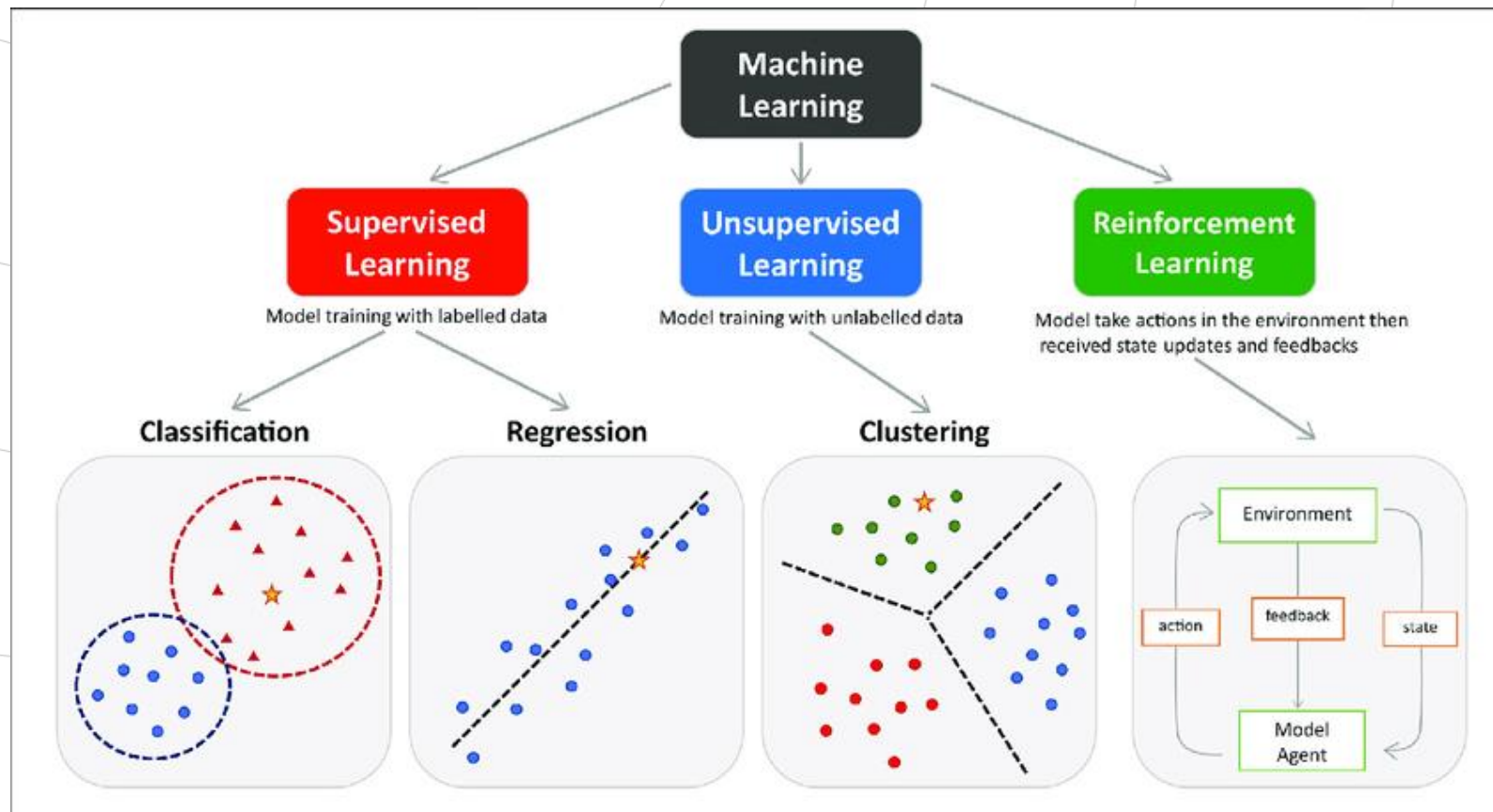
Source: Image is **AI-generated** from [StockCake](#).

What is Machine Learning (ML)?



Clustering explained with the example of the kindergarten arrangement task.
Source: Image from [AltexSoft](#).

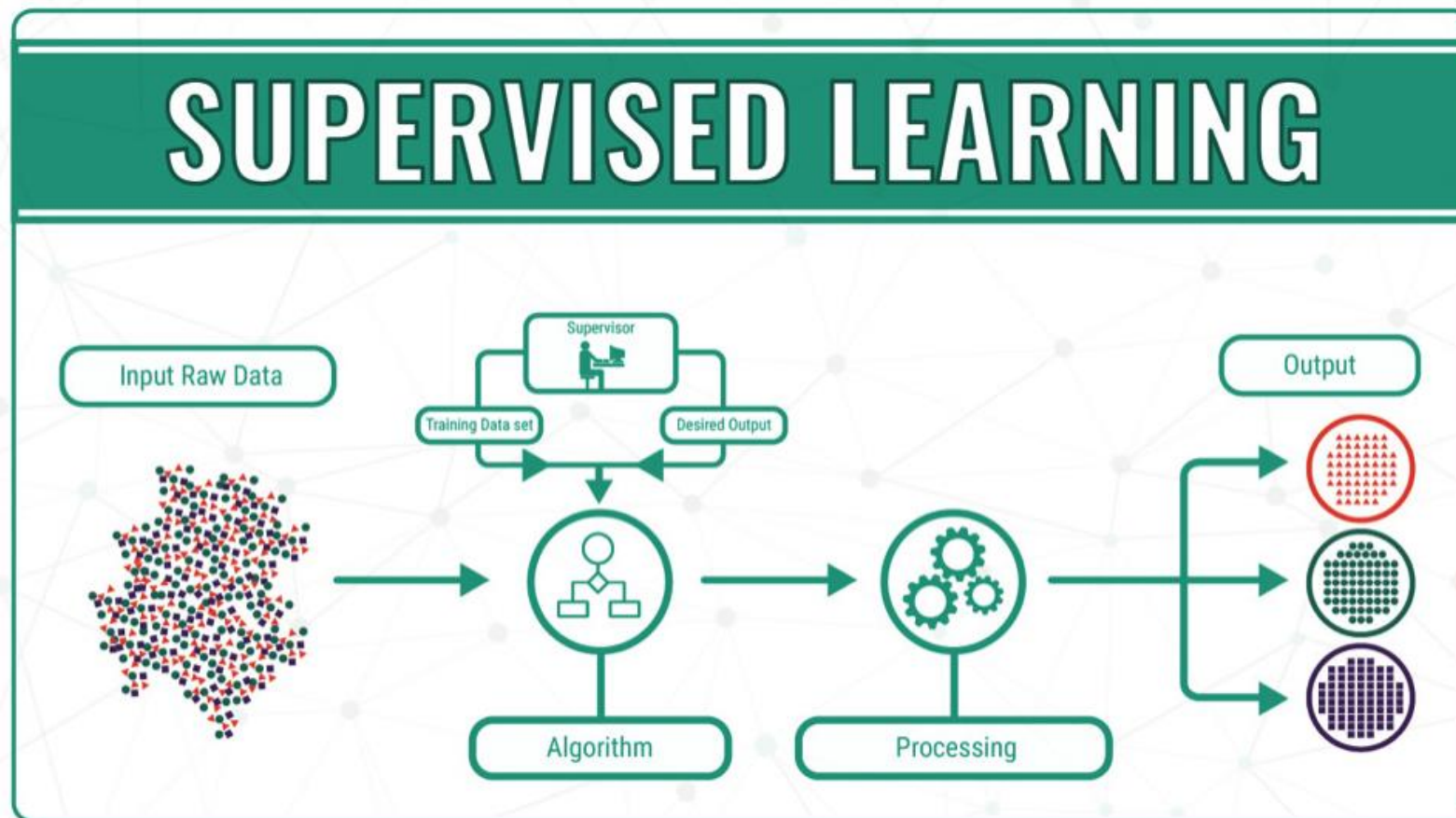
What is Machine Learning (ML)?



The main types of machine learning.

Source: Image from Frontiers in Pharmacology.

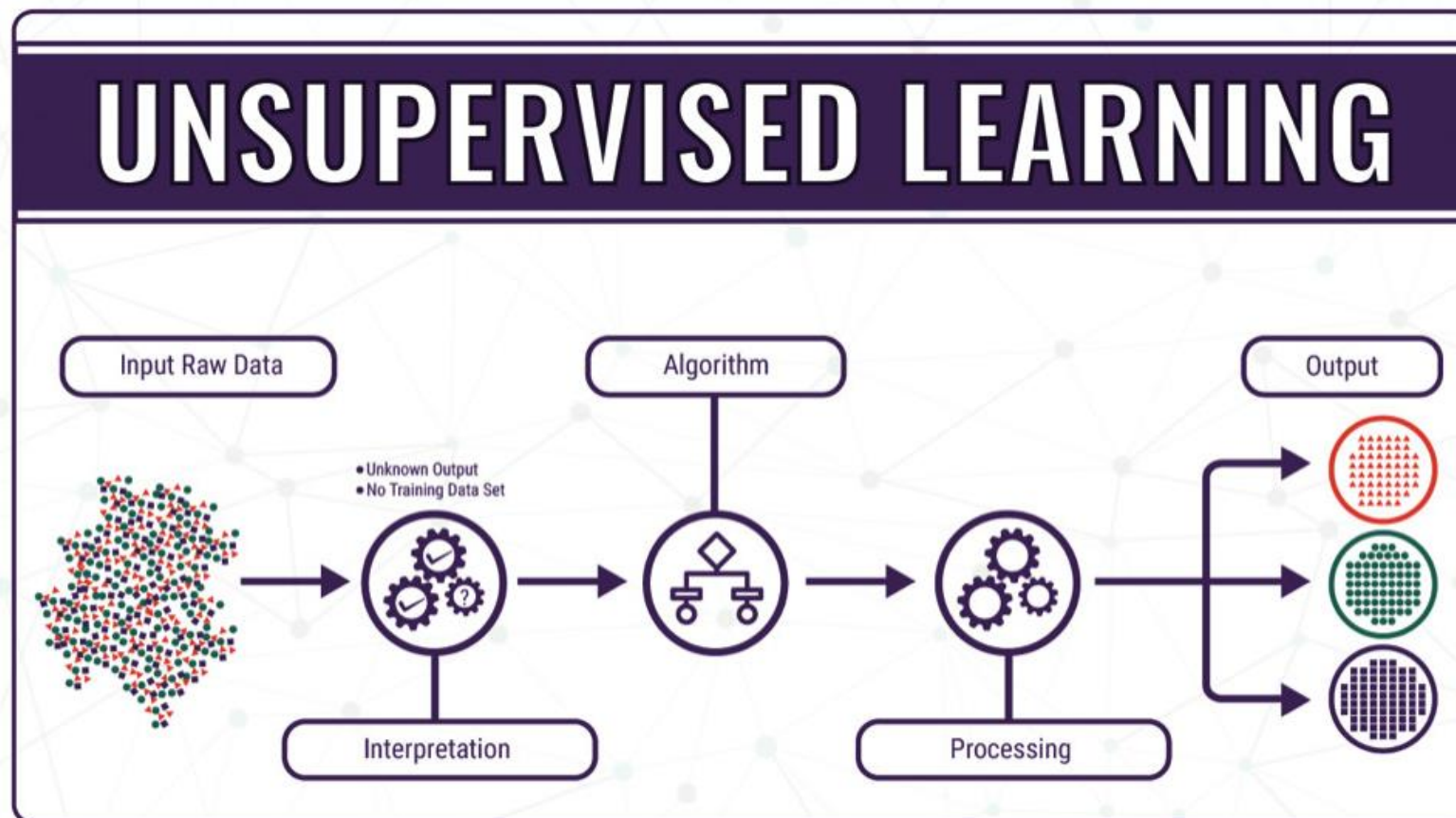
What is Machine Learning (ML)?



Supervised Learning.

Source: Ghahremani nahr, J., Nozari, H., & Sadeghi, M. E. (2021). Artificial intelligence and Machine Learning for Real-world problems (A survey). *International Journal of Innovation in Engineering*, 1(3), 38–47. <https://doi.org/10.59615/ijie.1.3.38>

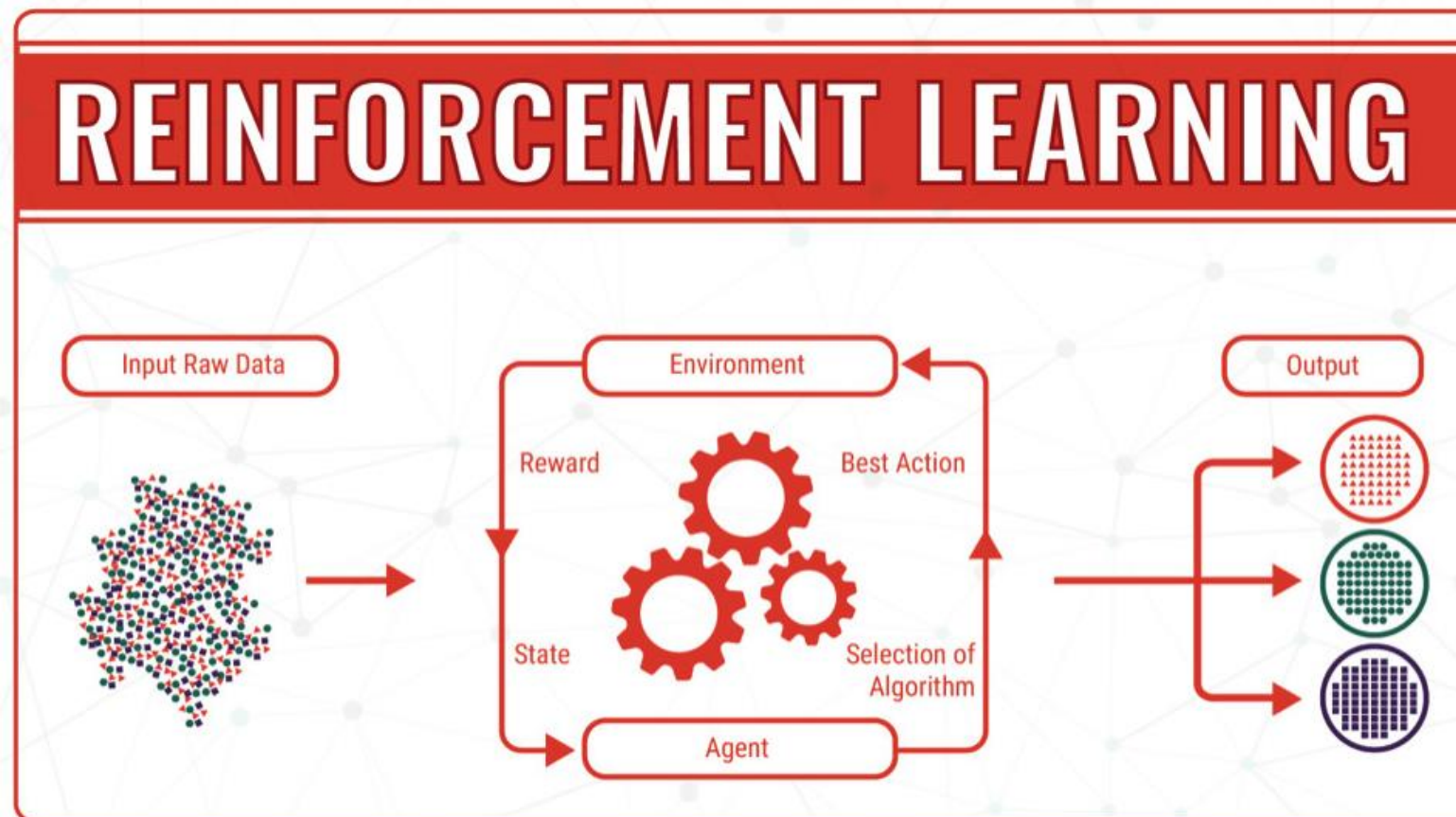
What is Machine Learning (ML)?



Unsupervised Learning.

Source: Ghahremani nahr, J., Nozari, H., & Sadeghi, M. E. (2021). Artificial intelligence and Machine Learning for Real-world problems (A survey). *International Journal of Innovation in Engineering*, 1(3), 38–47. <https://doi.org/10.59615/ijie.1.3.38>

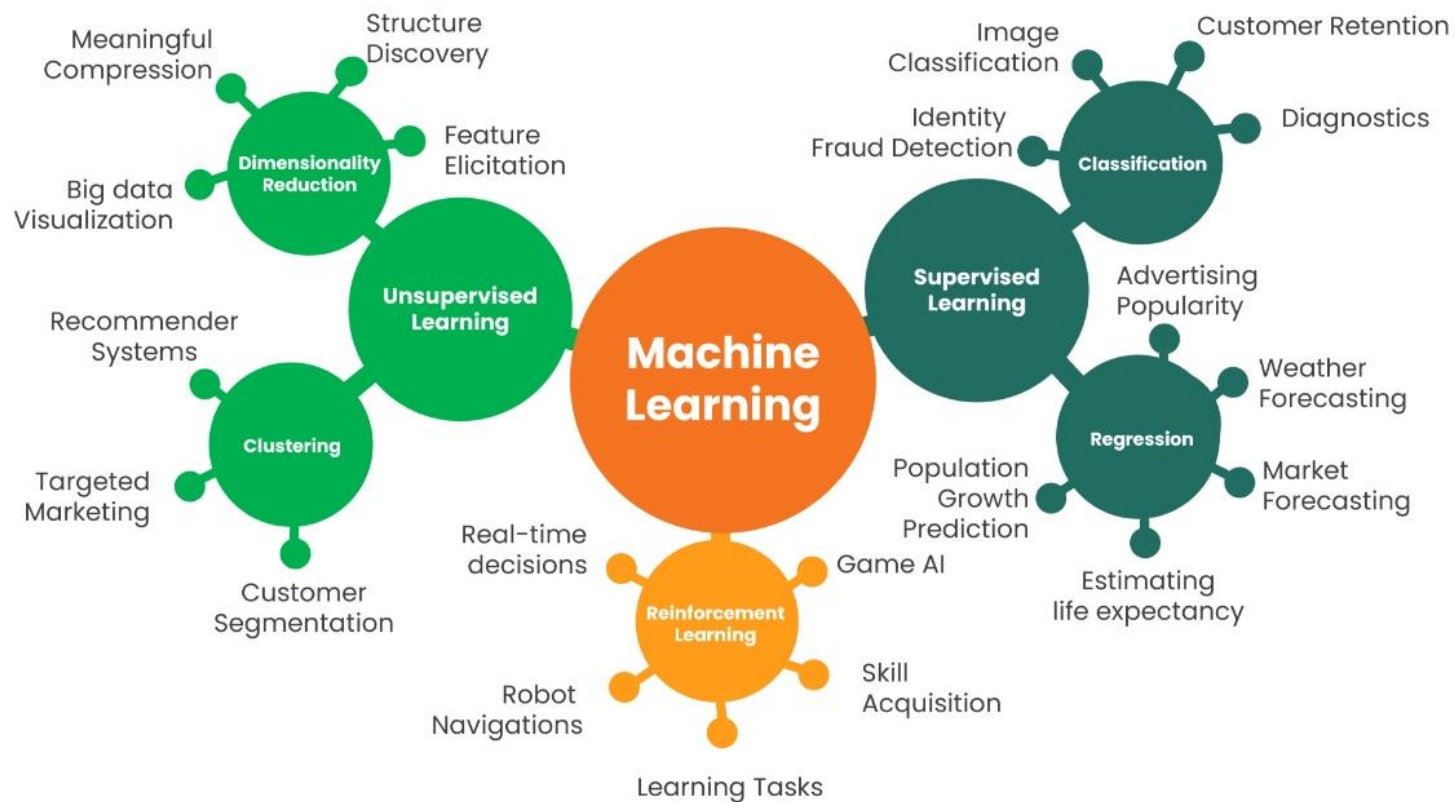
What is Machine Learning (ML)?



Reinforcement Learning.

Source: Ghahremani nahr, J., Nozari, H., & Sadeghi, M. E. (2021). Artificial intelligence and Machine Learning for Real-world problems (A survey). *International Journal of Innovation in Engineering*, 1(3), 38–47. <https://doi.org/10.59615/ijie.1.3.38>

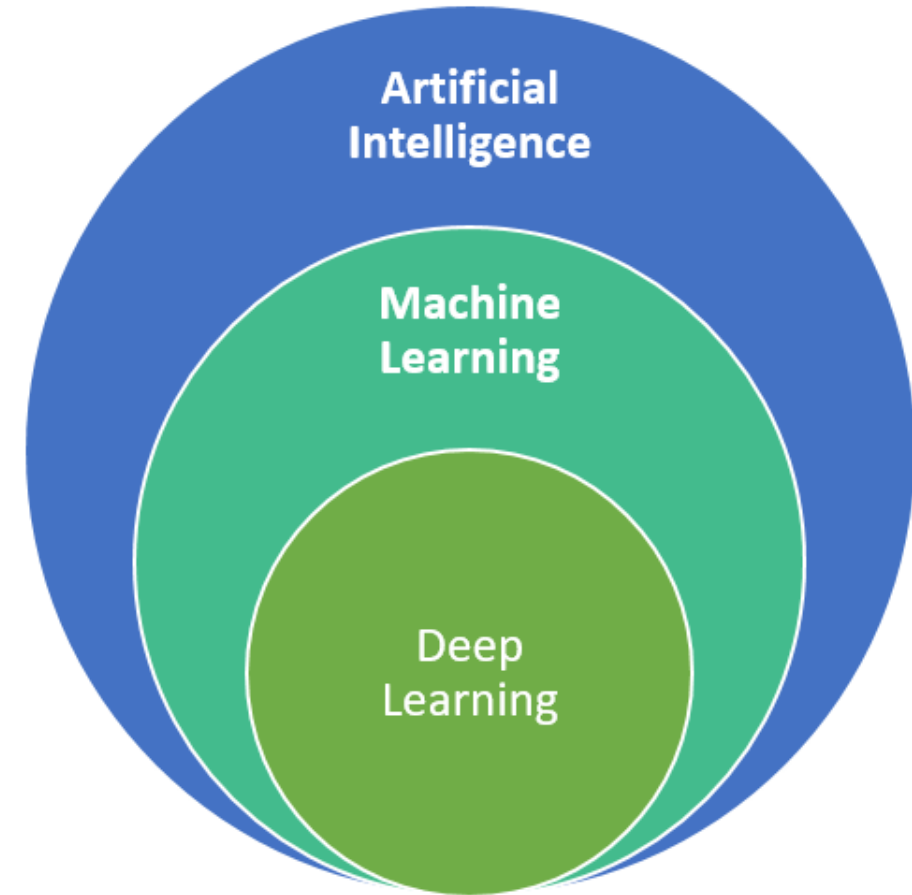
What is Machine Learning (ML)?



Types of Machine Learning.
Source: Image from [Axtria Inc.](#)

Deep Learning

Deep learning is a subfield of machine learning that utilizes artificial neural networks (ANNs) to model complex patterns and relationships in data.



AI, Machine Learning, and Deep Learning.
Source: Nadia BERCHANCE (M2 IESCI, 2018).

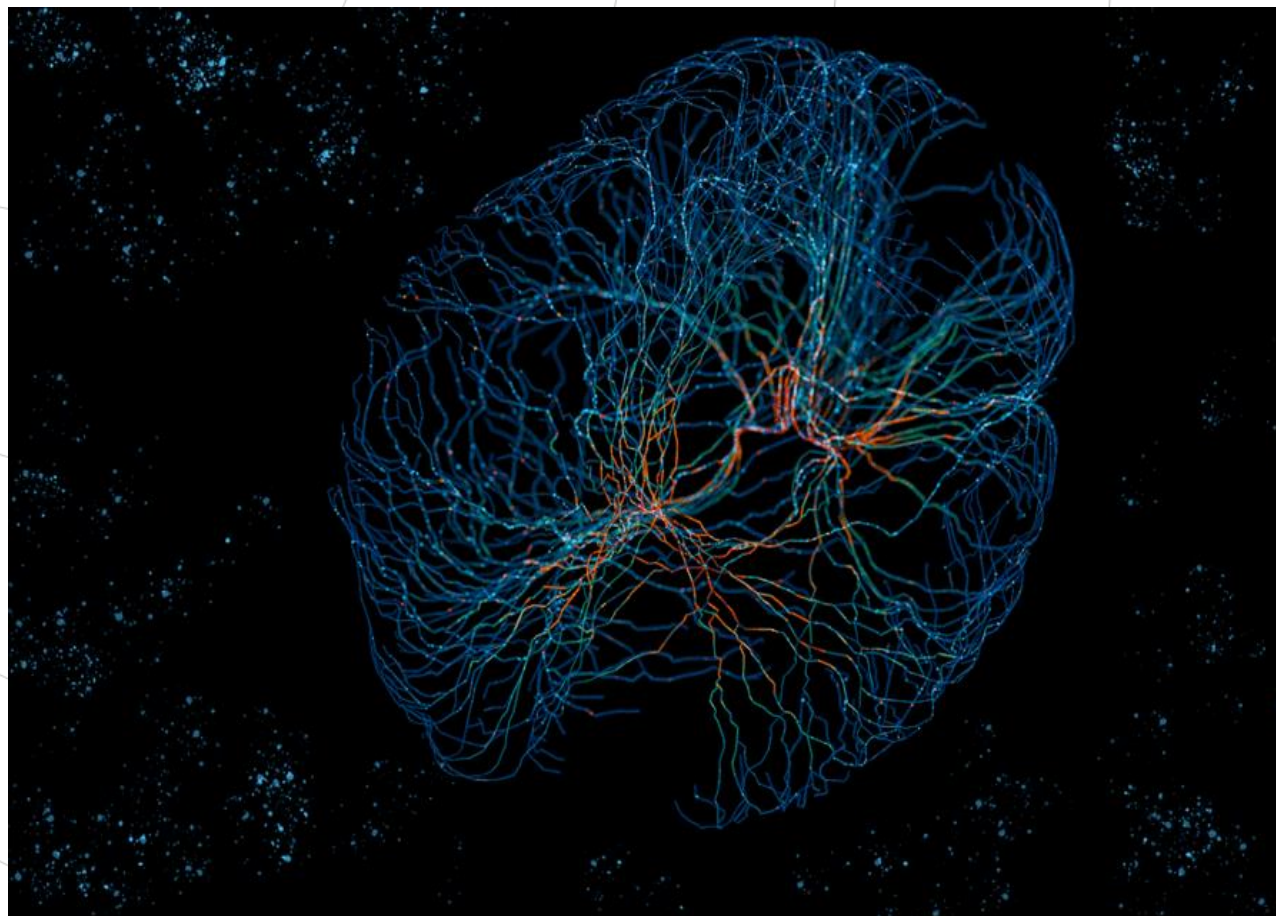
Deep Learning



Neural networks and brain.

Source: Image is **AI-generated** from [StockCake](#).

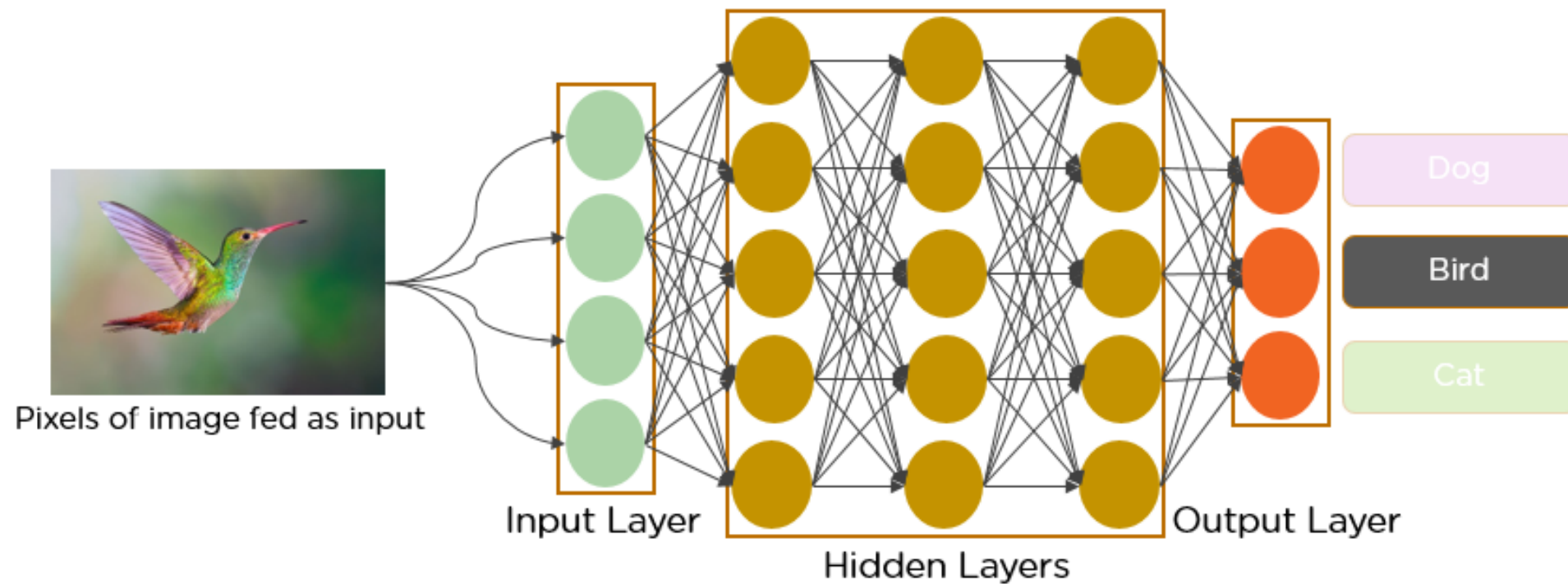
Deep Learning



Neural networks and brain.

Source: MIT News (Creator: Gremlin), <https://news.mit.edu/>

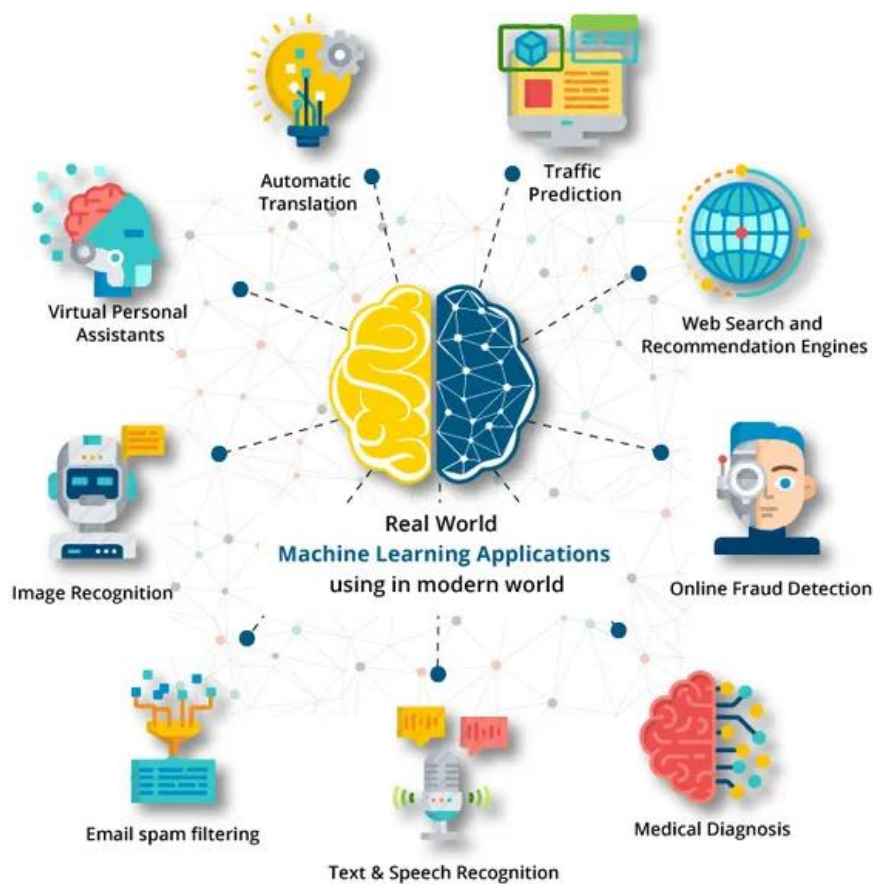
Deep Learning



Convolutional Neural Network to identify the image of a bird.

Source: Image from [Simplilearn](#).

(AI) Applications



Real-World Examples of Deep Learning.
Source: Image from [Learn Computer Science Online](#).

(AI) Applications

ChatGPT?



Gemini?



DeepL?

Natural Language Processing Applications: Gemini, DeepL, and ChatGPT.

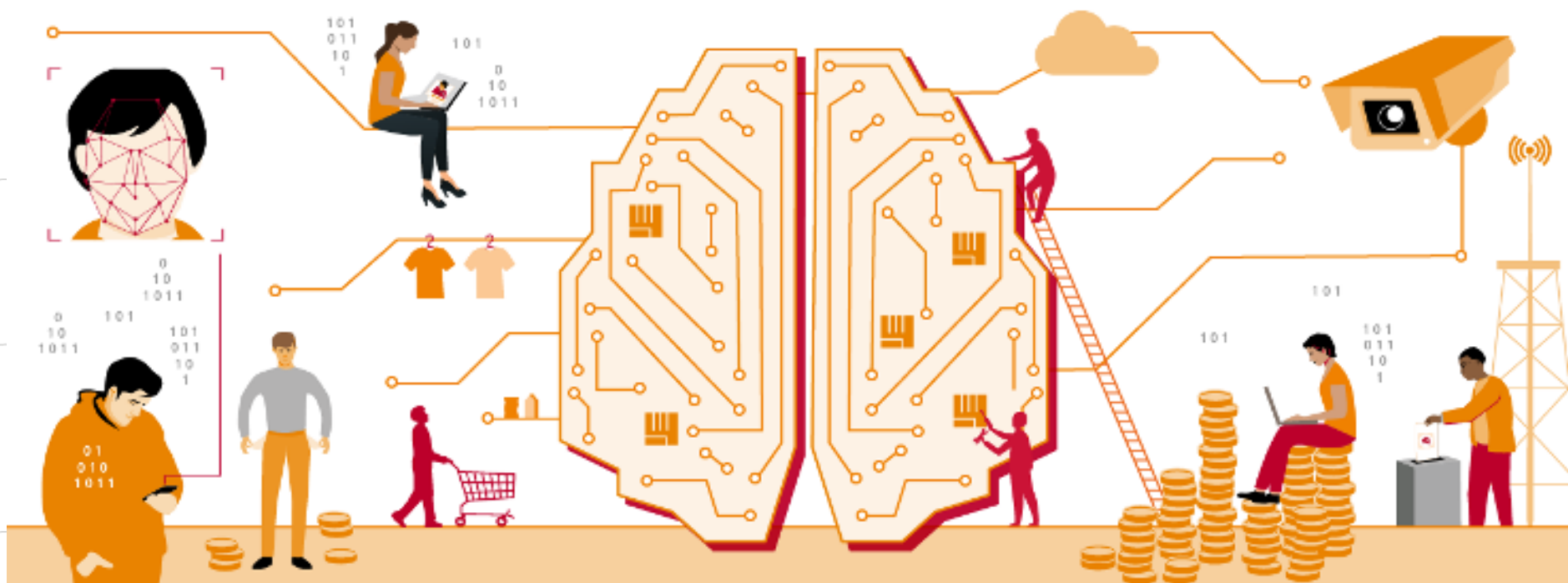
Future of (AI)?

AI is going to change the world more than anything in the history of mankind. More than electricity.— AI oracle and venture capitalist Dr. Kai-Fu Lee.



Source: Image from [Simplilearn](#).

Impact of (AI) on society



Society and Artificial Intelligence.

Source: Image from [University of Amsterdam](#).

Steps to Ensure Ethical AI



Ethics of AI.

Source: Image from [digwatch](#).

References

1. Vaswani, A., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., Kaiser, Ł., & Polosukhin, I. (2017). Attention is all you need. *Advances in neural information processing systems*, 30, 5998-6008.
2. Turing, A. M. (1950). Computing machinery and intelligence. *Mind*, 59(236), 433-460.
3. Hinton, G. E., Deng, L., Yu, D., Dahl, G. E., Mohamed, A. R., Jaitly, N., ... & Kingsbury, B. (2012). Deep neural networks for acoustic modeling in speech recognition: The shared views of four research groups. *IEEE Signal Processing Magazine*, 29(6), 82-97.
4. LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. *Nature*, 521(7553), 436-444.
5. Mnih, V., Kavukcuoglu, K., Silver, D., Rusu, A. A., Veness, J., Bellemare, M. G., ... & Petersen, S. (2015). Human-level control through deep reinforcement learning. *Nature*, 518(7540), 529-533.
6. He, K., Zhang, X., Ren, S., & Sun, J. (2016). Deep residual learning for image recognition. In *Proceedings of the IEEE conference on computer vision and pattern recognition* (pp. 770-778).
7. Rasa. (n.d.). Documentation. Retrieved from <https://rasa.com/docs/>

NTK

50°6'14.083"N, 14°23'26.365"E

Národní technická knihovna
National Library of Technology

Artificial Intelligence?!

Ibrahim Abou Khashabh

ibrahim.abou.khashabh@techlib.cz

